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10/783,143

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Stephan Lutgen

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EXAMINER

NGUYEN, TUAN N

ART UNIT

PAPER NUMBER

2828

MAIL DATE

DELIVERY MODE

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/783,143

Applicant(s)

LUTGEN ET AL.

Examiner

Tuan N. Nguyen

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

***Response to Amendment/ RCE***

1. In respond to applicant's amendment filed 12/10/2007, claim 1 has been amended. Claim 3 has been canceled. Claims 1-2, 4-25 are pending.
2. Applicant's interview, remarks, and amendment have been considered and are moot in view of new ground(s) of rejection.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-22, 25 are rejected under 35 U.S.C. 112, second paragraph. as being indefinite, vague, and confusing for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. With respect to remark and interview, the Applicant pointing out the language *"pump radiation source" is an optical pump source, and not an electrical pumping source, when claim 1 recites "a pump radiation source which is monolithically integrated into the semiconductor laser and configured to optically pump said active layer"*. The claim contains subject matter not described in the specification in such as way as to enable one skilled in the art to understand what is the optical pump source is, especially when the application's specification discloses the electrodes supply the pump radiation source (section [0057]. Hence, the electrodes are the pump radiation source, because if it is not the pump radiation source there is no need for the electrode. There is no means, structure and functional relationship, which render the claims vague and indefinite. Claims 1-22 and 25 are rejected base on the same reason.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of 35 U.S.C. 102(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1, 2, 9-14, 16-18, 23-25 are rejected under 35 U.S.C. 102(a) as being unpatentable over Chilla (US 2003/0012247).

With respect to claim 1, Chilla ('247) shows and discloses a laser device for generating laser pulses with an optically pumped semiconductor laser (*Fig 2,6,7: 50, 70, 80*), comprising: a semiconductor laser having an active layer (*section [0017]*); a first pump radiation source which is monolithically integrated into the semiconductor laser and configured to optically pump said active layer (*Fig 7*) ; an external resonator (*section [0018]*)(*Fig 2,6,7*); and at least one mode-locker (*sections [0021][0037]*).

With respect to claim 2, wherein the semiconductor laser is optically pumped by means of a second pump radiation source arranged externally (*Fig 6, 2*).

With respect to claim 9, 10 Chilla ('247) discloses wherein the resonator has a device for phase compensation, and arranged downstream of the resonator (*Fig 7, 8*) (*section [0037]*).

With respect to claims 11, 12 Chilla ('247) discloses the use of the optical fiber in the phase compensation, and the folding mirror (*Fig 6, 7, 8*).

With respect to claims 13,14 (Fig 1, 7) shows the resonator has a first resonator branch for generating laser pulses having a wavelength, and a second resonator branch for generating laser pulses having a second wavelength, and the pulses are coupled to one another in a phase-locked manner (Fig 8) (section [0038-0039]).

With respect to claims 16-18, the claims further require that the laser is a laser oscillator, amplifier, or CPA amplifier (Fig 2, 6-8)..

With respect to claim 23 Chilla ('247) discloses a laser device for generating laser pulses (*Fig 1, 2, 6, 7*) with an optically pumped semiconductor laser (*Fig 2, 6: 30*), comprising: an external resonator (*Fig 6: 74*), and at least one mode-locker wherein the resonator has a phase compensation element, said phase compensation element compensating for group velocity dispersion (*sections [0021][0037]; Abstract*).

With respect to claim 24, Chilla ('247) discloses the phase element compensation is integrated into the semiconductor laser (*section 0037*).

With respect to claim 25, Chilla '247 further shows (Fig 7: the first radiation source electrodes are arranged lateral to active layer).

6. Claims 23-24 are rejected under 35 U.S.C. 102(a) as being unpatentable over Paschotta (WO 01/59895).

With respect to claim 23 Paschotta (WO 01/59895) discloses a laser device for generating laser pulses (*Fig 1: 21, 1, 10 semiconductor device generating laser pulses 10, 10'; Fig 7: 2*)

with an optically pumped semiconductor laser (*Fig 1,7: 7*) (*Page 12: 5-15 diode pumping laser*), comprising: an external resonator (*Fig 7, 8: 12 external resonator*)(*Page 11: 10-24 first reflective and second reflective element 11, 12, "active mirror element"*), and at least one mode-locker (*Fig 1,7: 5*)(*Page 11: 15-20 SESAM semiconductor saturable absorber mirror*)(*Title: Passively mode-lock optically pumped semiconductor external-cavity laser*) (*Page 3: 10-20, passive mode locking technique relies on saturable absorber mechanism*), wherein the resonator has a phase compensation element, said phase compensation element compensating for group velocity dispersion(*ABSTRACT*)(*Page 11: 15-22 phase compensation saturable absorber mirror SESAM 5 and/or Bragg reflector compensating for velocity dispersion*).

With respect to claim 24 Paschotta (WO 01/59895) discloses the phase element compensation is integrated into the semiconductor laser (*Page 11: 19-22 the bragg reflector part of the semiconductor made of semiconductor and locking a desired wavelengths*) (*Page 5: 5-10 passively mode -locked incorporated into the semiconductor structure; page 7: 5-10 - passive mode-locked based on ion-doped crystal ; Page 13*).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or non-obviousness.
8. Claims 4-8, 15, 19-20 rejected under 35 U.S.C. 103(a) as being unpatentable over Chilla (US 2003/0012247) in view of Paschotta (WO 01/59895).

With respect to claims 4, 5, 6 Chilla ('247) shows and discloses the above. The claims further require a passive mode-locker that is a saturable absorber made of semiconductor material. Chilla ('247) did not discreetly disclose a saturable absorber passive locker. Paschotta (895) discloses a similar laser device optically pumped semiconductor laser having an active layer with an external resonator, and at least one passive semiconductor mode-locker saturable absorber (*Title; Fig 1,7: 5*)(*Page 11: 15-20 SESAM*)(*Page 3: 10-20*). It would have been obvious to one of ordinary skill in the art to provide Chilla ('247) with the a saturable absorber passive locker as taught or suggested by Paschotta (895), for the benefit of decreasing loss with increasing optical intensity.

With respect to claim 7 Paschotta (WO 01/59895) discloses the mode-locker is monolithically integrated into the semiconductor laser (*p 11: 19-22*) (*p 5: 5-10; p 7: 5-10; p 13*).

With respect to claim 8, Paschotta (WO 01/59895) discloses the mode-locker (10) is combined with a resonator mirror (9) (*Page 13: 22-26: SESAM 5*) (*Page 17: Table 1*).

With respect to claim 15 Paschotta (WO 01/59895) discloses the laser pulses have a pulse duration which is less than 100 ps (*Page 12: 23 pulse of 26ps*)(*Page 14: 19 – 25.7ps*)

With respect to claims 19, 20 Paschotta (WO 01/59895) shows the mode-locker is arranged in said external resonator, or arranged internally and part is arranged externally of the semiconductor laser. (*Fig 1: 5, 12, 8, 4*)(*Fig 7: 4,5,12*) (*Fig 8,9: 12,5*).

With respect to claims 21, 22, the claims further require that the laser pulse duration is less than 20ps and 1ps. Paschotta (WO 01/59895) discloses the laser pulses have a pulse duration around 19-25.7ps (*Page 12: 23 pulse of 26ps*)(*Page 14: 19 – 25.7ps*). It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum ranges involves only routine skill in the art.

### ***References***

9. The prior art made of record and relied upon is considered pertinent to applicant's discloses.

Albrecht et al. (US 2002/0001328); Kinoshita (US 6535537), Schmid et al. (US 7224710) show and discloses monolithic integrated optical pump semiconductor device having electrode as its pump radiation source.



*Communication Information*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan N Nguyen whose telephone number is (571) 272-1948. The examiner can normally be reached on M-F: 7:30 - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harvey Minsun can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan N. Nguyen

